descriptions of structures which might be improved in another edition, so as to make the meaning clearer to the student; as an example of this, the history of the development of hair may be mentioned. The brevity of some of the descriptions is, as the authors state, to some extent made up for by the number of woodcuts, but in some cases we think it would have been well had a few lines more been added, even had it been necessary to curtail some of the small print; thus on the first page surely it would have been well to have devoted a little more space to explaining what is meant by the words "ontogeny" and "phylogeny," terms which are constantly referred to throughout the work. It is true that this is also a fault of the original German edition, but as the translator has not professed to adhere strictly to the German text this is a liberty which he might have taken.

We regret to see the words ecto-, meso-, and endoderm used by Prof. Wiedersheim in the original German changed to epi-, meso-, and hypoblast in the English edition, as we consider the terms used by German and other Continental morphologists preferable to those employed by many English writers. We also traverse the statement in the footnote, presumably Mr. Parker's, that the former terms "are applied to the corresponding layers in the adult animal." The terms are respectively synonymous when applied to vertebrates; the skeleton or muscular system of a rabbit is not spoken of as its mesoderm, but as being of mesodermic or mesoblastic origin.

In describing the homologies of the carpus and tarsus, we quite approve of the position the authors have taken with regard to a subject of much controversy on which further investigations may throw more light, but we think in the general considerations regarding the derivation of limbs from fins the history of the evolutionary changes which have taken place is stated much more definitely than the state of our knowledge justifies. That the theory with which Prof. Wiedersheim's name is connected should be brought prominently forward was to have been expected, but no reference is made to other views, such as those of Gegenbaur and Götte, which, in the uncertain state of our knowledge of the subject, might have been expected. We notice that the pentadactyle form of *Equus* found by Marsh has been omitted in the illustrations of the ancestral forms of the horse's foot, and referred to only doubtfully in the text.

In the section on organs of circulation, the heart and its vessels are excellently described, and the introduction occasionally of coloured illustrations makes the subject as clear as could be desired, but the description of the formation of the circulation in the liver and the modifications of the trunk vessels which have occurred in the evolution of the higher from the lower vertebrates, is very short and meagre.

The criticisms which we have passed, however, are not made with the view of finding fault with an excellent and creditable work, but are expressed in the hope that in future editions it may be made more useful for the purpose for which it is intended.

In conclusion, we heartily thank Mr. Parker for introducing to English students a work which we are confident will prove a great assistance to them in their studies, and by perusal of which they will be enabled to understand the anatomy of man in a much more comprehensive manner than they could from a study of human anatomy alone.

J. G. G.

SCIENCE IN NORWAY

Nyt Magazin for Naturvidenskaberne. "New Journal of Natural Science." (Christiania, 1886.)

THE four volumes of this admirable publication which have been sent to us by the Norwegian publishers, include the twelve numbers printed since 1882, and thus complete the third series of the magazine, which, notwithstanding its title of "New," is the oldest Norwegian publication of its kind.

The subjects treated of in its pages belong, with few exceptions, to the general natural history of Norway, in which department special attention is due to Herr Leonard Stejneger's paper on the "Ornithology of Western Norway," as well as to the various interesting contributions of Dr. Robert Collett. To the latter eminent naturalist, well known for his able work "On the Fishes of Norway" (1874), the magazine is indebted for several communications regarding the number and distribution of various species of fishes, first observed in Norway between 1879 and 1883, while in his papers on the character and species of mammals indigenous to Norway, he has contributed much useful information in reference to the Norwegian beaver (*Castor fiber*). From the author's observations, it would appear that the injury done to the forests by these animals in bringing down trees for the construction of their huts in no way justifies the indiscriminate destruction of the beaver, which had long been allowed to go on unchecked in Norway. This view has of late been so generally accepted that the Norwegian Government have been induced to appoint a close time of nine months in the year, during which the shooting or trapping of the beaver is legally prohibited. In special cases, and in certain districts, the local magistrates may even extend this period to ten years if they see reason to apprehend the extermination of the animal.

Norwegian geology and mineralogy are well represented in these volumes, Dr. Kjerulf having added to his labours of an editor those of a diligent contributor, and besides several short papers on the finer mineralogical specimens derived from the Storvarts and other important Norwegian mines—a subject which is also well treated by Herrn Olsen, Münster, and Knudsen—he has enriched the journal with interesting monographs on the local geology of the country, including notices of the dislocations observable in the Christiania valley; the character of the formations at Mjösen-lake which have been brought to light through recent railway-cuttings; and the inclination of the principal lodes on Ekersund. Dr. Hans Reusch describes at length the fall of meteors observed at Vaage in Tysne Island on May 20, 1884, giving useful tables of meteoric falls, whose dates are well attested, between 1784 and 1884. Besides various other papers, Dr. Reusch contributes some interesting geological notices of the districts of Christiania, Valders, and Viksnes, and considers at some length the evidence afforded by the fjelds of Western Norway, of the duration of the Ice age, and the local extension of glacial action in Norway.

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The marine zoologist will find much valuable matter in the interesting reports by Messrs. Danielssen and Koren of the Asteridea, collected in the Norwegian North Atlantic Expedition. These papers are a *résumé* of the complete volume, which will appear later on as part of the Collective Report of the Expedition. Of the 20 genera and 40 species collected, 4 genera and 11 species are new to science. Numerous specimens of the Pedicellaster found in West Greenland, and described by Dr. Sladen as new, to which he gave the specific name of Palæocrystallus, is identified by Dr. Danielssen as *P. typicus* of Sars. Extreme importance attaches to the discovery and careful examination of a specimen of an asteroid—unfortunately the only one secured—which differs from others of the family by having a central dorsal appendage, generally erect, but capable of motion. This curious Echinoderm, to which Messrs. Danielssen and Koren give the name *Hyaster mirabilis*, is conjectured by them to represent a larval or developmental stage of the Crinoidea, and after a careful study of this stalk-like appendage they hazard the conjecture that further investigations may lead to the discovery that the Asteridea are in fact developed from the Crinoidea. Equally interesting, if less important, is the re-discovery of the Greenland "Clusterpolyp" of Ellis, the "*Zoophytum grönlandicum*" of Mylius. The specimens examined by these earlier naturalists have long disappeared, and for more than a hundred years no others were found. The *Challenger* Expedition brought back several forms of an Umbellula, one of which Prof. Kölliker considered to be of the same species as the lost specimens of Ellis and Mylius; the Norwegian naturalists are of opinion, however, that all the specimens found are mere varieties of *Umbellula encrinus*, to which they ascribe a wide geographical range.

In conclusion, while we desire strongly to recommend the *Nyt Magazin*, it may not be out of place to mention that several of the most interesting papers on local Norwegian geology are written in German, and that the highly important results of the recent Norwegian North Atlantic dredgings are given by Dr. Danielssen in English, under the title of a "Preliminary Report" of the Expedition. The magazine, which is under the joint editorship of Professors Kjerulf, Danielssen, Mohn, and Hiortdahl, is printed in the Latin type now so generally used in the Norwegian press, and is copiously illustrated by well-drawn woodcuts, and excellent plates of the animals described.

OUR BOOK SHELF

Acta Mathematica. (Stockholm. Various dates.)

THIS journal, which has already won for itself the reputation of being one of the leading mathematical journals, not of the North merely, but of the world, sprang into life at the end of 1882, is published at Stockholm, and has all along been under the able editorship of Prof. G. Mittag-Leffler, assisted by all the foremost mathematicians of Sweden, Norway, Denmark, and Finland. Its object is stated to be to gather and publish such mathematical works as contribute to the development of the science by the novelty either of the results obtained or of the methods employed.

The seven volumes which have been issued contain papers by some of the foremost Continental mathematicians: the sole contribution, we believe, in English is furnished by an American writer, Mr. G. W. Hill, and is entitled "On the Part of the Motion of the Lunar Perigee which is a Function of the Mean Motion of the Sun and Moon" (this paper occurs in vol. viii., which is in course of publication). There are in all, in the complete volumes, 107 papers, in almost every department of the science.

It may be in the recollection of our readers that Oscar II., King of Sweden and Norway, who is styled "Special Protector of the Journal," has instituted a great mathematical prize for an important discovery in higher analysis, the particulars of which have appeared in full detail in our columns (vol. xxxii. p. 302); the prize works are to be published in the *Acta*.

The Methods of Glass-Blowing. By W. A. Shenstone. (Rivingtons, 1886.)

NOT only the student who is entering, or has just entered, that mystic land of chemical research, but also the ordinary student of chemistry who wishes to be more than a mere beginner, or a book-chemist, will hail with great joy the appearance of this little book on glass-blowing. We have not many good professional glass-blowers in this country, and, as the author says, it is a difficult if not impossible thing to get any instruction in glass-blowing; and, as a result, the great bulk of chemical students are as dependent on the dealers in glass ware as the bulk of amateur photographers are on dry plates and other things in that connection.

Most students even in our hardest working laboratories have some time to spare in which they might practise some of the more useful and simple methods of making glass apparatus mentioned and described in this little book.

Apart from the immediate utility of being able to make one's glass apparatus in the laboratory, and the help it is in almost any form of chemical or physical research, it cannot fail to be also indirectly useful to a student on his transplantation to a works or the superintendence of some technical operation, and will give him what is so very desirable, in addition to that of the purely chemical manipulation of analysis, a feeling of confidence in overcoming mechanical difficulties.

In the introduction is a description of a suitable working-place, blow-pipe, and bellows—things which are seldom to be found fit to use in our laboratories—and the blow-pipe flames; after which the varieties of glass mostly used, and the actual operations involved in the construction of most glass apparatus, in which glass tubes are the main parts, are very plainly described, being also in many cases illustrated with diagrams of the different stages. The last chapter is devoted to "calibrating and graduating glass apparatus," operations we think every student who gets as far as quantitative analysis should be able to perform in a decent manner.

We most thoroughly recommend this little book to students who intend to become chemists, and hope the proportion of those who can blow a respectable bulb will soon be increased. At present it is about ·1 per cent.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*

[*The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to insure the appearance even of communications containing interesting and novel facts.*]

Two Hours with a "Subject Index"

THERE has appeared within the year, under the title of "A Subject-Index to the Modern Works added to the

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